Proposal Reviews

#232: Sacramento River Chinook Salmon Individual-based Model

US Fish and Wildlife Service

Initial Selection Panel Review:

Proposal Number: 232

Applicant Organization: US Fish and Wildlife Service

Proposal Title: Sacramento River Chinook Salmon Individual-based Model

Please provide an overall evaluation rating.

Explanation of Recommendation Categories: Fund

- **As Is** (a proposal recommended for funding as proposed)
- **In Part** (a proposal for which partial funding is recommended for selected project phases or components)
- **With Conditions** (a proposal for which funds are recommended if the applicant contractually agrees to meet the specified conditions)

Consider as Directed Action in Annual Workplan (a proposal addressing a high priority action that requires some revision followed by additional review prior to being recommended for funding)
Not Recommended (a proposal not currently recommended for funding-after revision may be considered in the future)

Note on "Amount":

For proposals recommended as Fund As Is, Fund In Part or Fund With Conditions, the dollar amount is the amount recommended by the Selection Panel.

For proposals recommended as Consider as Directed Action in Annual Workplan, the dollar amount is the amount requested by the applicant(s).

Fund	
As Is	-
In Part	-
With Conditions	-
Consider as Directed Action	X
Not Recommended	-

Amount: **$350,000.00**

Conditions, if any, of approval (if there are no conditions, please put "None"):

None

Provide a brief explanation of your rating:

Technical and external science review ratings were adequate and poor-good, with regional ratings ranging from poor to good. The strategic benefit to this desktop modeling pilot study was not apparent although it does link to PSP Multi-Region Priority 6 on understanding of at-risk species. The models development can be very important once the model expands geographically and progresses through the validation stage. The proposal needs considerable specific information, including the tests and deliverables expected from this portion of individual-based model development, and an explanation of the loss of the prior funding source. Thus, review and revision as a directed action are encouraged. The USFWS Fishery Research Office in Vancouver, Washington, has unique skill in developing chinook salmon population models. The proposal may benefit from their review. Suggest proposal team include critical technical and proposal strategy reviewers of the draft proposal and include details on the products of this effort and why it cannot be funded by others.

Research and Restoration Technical Panel Review:

CALFED Bay-Delta 2002 ERP PSP
Research and Restoration Technical Panel Review Form

Proposal Number: 232

Applicant Organization: US Fish and Wildlife Service

Proposal Title: Sacramento River Chinook Salmon Individual-based Model

Review:

Please provide an overall evaluation summary rating:

Superior: outstanding in all respects;
Above Average: Quality proposal, medium or high regional value, and no significant administrative concerns;
Adequate: No serious deficiencies, no significant regional impediments, and no significant administrative concerns;
Not Recommended: Serious deficiencies, significant regional impediments or significant administrative concerns.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Superior **-**Above average **X**Adequate **-**Not recommended	**Rankings by members of our review panel were good and good/poor, respectively. We would have ranked this proposal higher than adequate if it had provided a more explicit notion of the kinds of predictions that could be made using the developed IBM model and of how such predictions might or might not vary from far simpler models that might contain the same structural elements and assumed functional relationships but which operated at a cohort rather than an individual level. The proposal chose to use a nearly entirely text-based (math-free) presentation of the modeling approach rather than to illustrate the contrast between an IBM and more typical cohort-type models. We were unable to judge what might be delivered by CALFEDs investment of $315k in a modeling exercise. We do not mean by our rating to imply that IBM approach is a bad one for Sacramento chinook. Instead, we wish to indicate that this proposal did not persuade us of the instrinsic merits of these new IBM methods. We also express concern that USFWS funding has stopped at this particular point in model development? Funding is apparently not available, but why not? How much funding has previously been supplied by USFWS? Does USFWS believe that investment in development of this IBM model has thus far been successful? The proposal failed to discuss these issues.**

1. **Goals and Justification.** Does the proposal present a clear statement of goals, objectives and hypotheses? Does the proposal present a clear justification and conceptual model for the project?

The underlying hypothesis of the proposed continued model development is that chinook salmon in the Sacramento River system are predictably affected by measurable environmental conditions, and that it is possible to effectively model and reasonably predict population responses. Although the stated major objective is test the conceptual models and their interactions, no such tests were described.

2. **Likelihood of Success (Approach, Feasibility, Capabilities and Performance Measures).** Is the project likely to succeed based on the approach, feasibility and project team capabilities? Are the proposed performance measures adequate for measuring the project's success?

   Its tough to judge whether or not this project would be likely to succeed because CALFED would apparently only be paying for a single year (at $315k) of continuing model development whereas project participants have received substantial previous funding from USFWS to construct essential parts of the Sacramento River Chinook IBM. It certainly seems likely that additional positive developments to what must be a huge model might be accomplished with $315k. Thats a lot of $$ for a pure modeling exercise that requires essentially no supplies or travel, etc.. We really could not judge how success might be judged for a model such as this.

   We agreed, however, that continued development and testing of the model is probably warranted. However, testing of this model should probably also include testing it against a model that incorporates similar assumptions as an IBM but is a more classic fisheries dynamics-type model.

3. **Outcomes and Products.** Will the project advance the state of scientific knowledge in general and/or make an important contribution to the state of knowledge of the Bay-Delta Watershed? For restoration proposals, is the project likely to contribute to ecosystem restoration or species recoveries in a significant way? Will the project produce products useful to decision-makers and scientists?

   According to the proposal, The performance measure for a modeling project are the model itself, its documentation, and any reports or evaluations accompanying its delivery.

4. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   As noted previously, $315k can buy an awful lot of highly trained modeling expertise and no new site data are proposed for collection.

5. **Regional Review.** How did the regional panel(s) rank the proposal (High, Medium, Low)? Did the regional panel(s) identify significant benefits (regional priorities, linkages with other activities, local involvement) or impediments (local constraints, conflicts with other activities, lack of local involvement) to this proposal? What were they?

   Regional reviews of this project were mixed and range from low (Delta) to medium (Bay) to high (Sacramento). Variation in rankings appears to be based on the degree to which the model currently contains explicit modules for various regions. A module for survival through the Delta has apparently not yet been constructed and development of such a model may be many years off.

6. **Administrative Review.** Were there significant concerns about the proposal with regard to the prior performance, environmental compliance and budget administrative reviews? What were they?

No unusual matters were raised.

Miscellaneous comments:

The proposal mentions model calibration at many points. Presumably this term refers to the models ability to generate numerical output that is somewhere near the magnitudes of various output variable values that are believed correct based on existing data for Sacramento chinook. The proposal does not appear to address the more complex and more important question of model validation. Actual structure and assumptions of this complex model are not explicitly stated in the proposal. Instead, the reader is only provided with overviews of the nature and purpose of various modules.

Bay Regional Review:

Proposal Number: 232

Applicant Organization: US Fish and Wildlife Service

Proposal Title: Sacramento River Chinook Salmon Individual-based Model

Overall Ranking: **-**Low   **X**Medium   **-**High

Provide a brief summary explanation of the committee's ranking:

The panel supports research that delivers scientific information which improves understanding about key ecosystem processes in the Bay + Suisun Marsh or about species and habitats which are insufficiently understood. This project can help improve understanding of how chinook use the bay. It's a good project, but not essential in the region now.

1. Is the project feasible based on local constraints?

    XYes **-**No

    How?

    Yes - previous work done establishes base for this work.

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

    XYes **-**No

    How?

    Develop conceptual understanding of at-risk species + models that cross multiple regions).

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

    XYes **-**No

    How?

    Proposal seeks to complete and calibrate base model for wider use and applicabiity.

4. Does the project adequately involve local people and institutions?

    XYes **-**No

    How?

It would be nice to see more training incorporated (3-4 single-day trainings) as opposed to only one.

Other Comments:

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Delta Regional Review:

Proposal Number: 232

Proposal Title: Sacramento River Chinook Salmon Individual-based Model

Overall Ranking: **X**Low **-**Medium **-**High

Provide a brief summary explanation of the committee's ranking:

This project's value to restoration in the Delta region isn't clear. Its schedule is described.

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   The project is probably feasible, but the items listed below should be squared away before any action on the application is taken.

   o The products of this proposal include a calibrated useable individual-based model of mainstem Sacramento River fall-run chinook salmon, a model distribution compact disc including interactive installation to Microsoft Windows data files and model documentation, a one-day training workshop for model users, and a model description and user=s manual. All of these products are to be completed and made available one year after work begins.

   o Lack of detail in work schedule precludes assessment on feasibility. The specific tasks to be performed to complete the development of the products are not identified. The qualifications of seven people are presented, but their particular roles in the project are not specified.

   o No CEQA or NEPA documents will be required to complete the proposal.

   o The proposal indicates that this project is the first year of a three-year effort, although only this first year will be funded by CALFED. Subsequent work will refine and expand the capabilities of the model.

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

   XYes **-**No

   How?

   o This proposal is consistent with ERP Draft Stage 1Multi-Region Restoration Priority #6 (Ensure at-risk species' recovery by developing conceptual understanding + models that cors regions), in the subsequent stage of development when the winter-run sub-model becomes available. (There is no immediate application to the Delta-Eastside Tributaries region. If the geographic scope of the model is expanded in the future the Delta-Eastside Tributaries region might be included.)

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

   XYes **-**No

How?

o The model in its present form will be limited to assessing salmon-related issues on the mainstem Sacramento River. When the model is developed completely its applicability will extend Central Valley basin-wide. o The model will be applicable to evaluate restoration actions and explaining trends in populations of all four races of chinook salmon in the Central Valley.

o There is no evidence that this project is duplicating model development efforts or existing models elsewhere.

4. Does the project adequately involve local people and institutions?

   -Yes **X**No

How?

o The proposal indicates that local involvement is not applicable to this project.

o There is no indication of either support or opposition to this project from the local public, stakeholder groups or State or Federal agencies.

Other Comments:

X

Sacramento Regional Review:

Proposal Number: 232

Applicant Organization: US Fish and Wildlife Service

Proposal Title: Sacramento River Chinook Salmon Individual-based Model

Overall Ranking: **-**Low   **-**Medium   **X**High

Provide a brief summary explanation of the committee's ranking:

The panel believes this is an important study that should be conducted. The proponents are well qualified to carry out the study. Please see additional comments below.

1. Is the project feasible based on local constraints?

    XYes **-**No

    How?

    This proposed project is very useful and appropriate to CALFED ERP projects. One of the strengths of this project lies in the testing and calibration of an already developed model. The project's personnel are experienced and the variables identified will be useful for ERP funding allocations.

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

    XYes **-**No

    How?

    The project applies to the following PSP priorities: SR-6 (ensure recovery of at-risk species by developing conceptual understanding and models); SR-7 (develop conceptual models to support restoration); SR-3 (conduct adaptive management experiments regarding flow regimes).

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

    XYes **-**No

    How?

    The project uses information from prior CVPIA funding (hydrological and biological monitoring), which resulted in model development that will be the basis for this project. This project is the next step to implementing model, and would be usable by other projects for modeling purposes. Furthermore, it provides information for decision makers and researchers.

4. Does the project adequately involve local people and institutions?

     -Yes **X**No

How?

Local involvement is not applicable to this project.

Other Comments:

The budget should be carefully checked.

External Scientific: #1

Proposal Number: **232**

Applicant Organization: **US Fish and Wildlife Service**

Proposal Title: **Sacramento River Chinook Salmon Individual-based Model**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

Excellent: outstanding in all respects;
Good: quality but some deficiencies;
Poor: serious deficiencies.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Excellent	**Given that this proposal does not provide an adequate explanation of the size of nature of the existing state of the IBM for Sacramento chinook, I cannot imagine why CALFED should spend $315k on continuation of this modeling exercise. The effort may be a good one - I could be persuaded that such a model would be meaningful - but the proposal does not do that. Without a decent notion of the kinds of assumptions and relationships that are present in the existing model, it is impossible to determine whether or not continuation of the effort is advised. The cause may be good, but the proposal is not.**
-Good	
XPoor	

1. **Goals.** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   There are no real hypotheses associated with further development of this individual-based model but the objective of further model development seems rather clear.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

The proposal uses words rather than flow charts and mathematical equations to justify itself. As I do a considerable bit of modeling (population dynamic and statistical) myself, I found this kind of justification unsatisfactory. Overall, I would say that the proposal did not present an adequate "conceptual model".

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   It is impossible to assess the merits of the model because important assumptions and assumed mathematical relationships are presented for only one trivial component of what must be a large number of model components. Pages of the proposal are not numbered, but there is a brief description of a basic mortality model, with incomplete notation, that would be recognized as a generalized competing risks of death model (no reference provided). On the previous page the authors invoke the notion of using "super-individuals" to represent some large number of individuals and they draw an analogy to stratified sampling in opinion polls. The analogy cannot be an simple one becuase the performance of straified sampling is itself very sensitive on sample sizes within strata and on the characteristics of strata. Neither topic is discussed in the proposal, so it is impossible to judge to veracity of claims that using "superfish" is the right way to go when the sheer numbers of individuals would otherwise be prohibitively large in computational time. (They do, however, cite references in prestigious journals on this topic.)

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   I'm certain that a model could be constructed by the assumbled team. Whether this constructed model would have any genuine merit is an important question that is inadequately addressed by the authors. How do they propose to "validate" their model? Suppose that they find that their model suggests that the color of a fish released from hatcheries is an important model variable? How could they validate that finding? I have no idea if their approach is likely to be "successful" in any conventional sense. They do not propose any "tests" of the model which would seem critical.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   see Products

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   a working "calibrated" model; CD; training workshop; user's manual; etc.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

the team is probably qualified, but brief CVs (one paragraph narratives) do not provide an adequate indication of PI skills.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   This baby would cost $315k for one year of work.

Miscellaneous comments:

External Scientific: #2

Proposal Number: **232**

Applicant Organization: **US Fish and Wildlife Service**

Proposal Title: **Sacramento River Chinook Salmon Individual-based Model**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

Served as a technical advisor to the proposal applicant when he was working on the Trinity River in the 1980s

Review:

Please provide an overall evaluation summary rating:

Excellent: outstanding in all respects;
Good: quality but some deficiencies;
Poor: serious deficiencies.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Excellent	**The proposal as presented is a necessary next step building on previous CVPIA funding. Perhaps CalFed funds are best reserved for testing and validation after the model is fully calibrated to the Sacramento River with CVPIA funds. Surely the FWS will complete this next step considering their support to date and the likelyhood for success.**
XGood	
-Poor	

1. **Goals.** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   The stated major objective is to test how the conceptual models (comprising the individual based model) interact and the degree to which they describe effective stressors on Chinook populations. However, no such tests are described. Rather it appears that the goal (their stated purpose) is to complete and calibrate the existing Sacramento Chinook model and to produce a model distribution package including software and documentation. The stated hypothesis is that Chinook salmon in the Sacramento River system are predictably affected by measurable environmental conditions, and that it is possible to effectively model and reasonably predict relative population responses. No design is presented for testing this hypothesis. The proposed project is timely in that the initial development of the Sacramento

Chinook model under CVPIA funds through the Fish and Wildlife Service should be calibrated with Sacramento River data and submitted to testing and validation.

2. <u>Justification.</u> Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

   The conceptual model is clearly presented and calibration to existing conditions is certainly justified. However, as presented this project is more a pilot or demonstration project rather than a research project.

3. <u>Approach.</u> Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   Continued development and testing of this model is certainly appropriate and the approach presented is well documented and likely to provide an important base of knowledge that will ultimately be useful to decision-makers after testing and validation.

4. <u>Feasibility.</u> Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   As presented the approach is feasible, consistent with the stated purpose and likely to be successful.

5. <u>Project-Specific Performance Measures.</u> Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   As stated in the proposal the model itself will be the performance measure. Adequate documentation, training workshop, users manual and presentations in public forums are presented.

6. <u>Products.</u> Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   The model product is likely to be of high value and interpretive outcomes should be forthcoming after proper testing and validation. Unfortunatly the necessary testing and validation steps are not presented in this proposal. The implication is that such future work will be funded by FWS.

7. <u>Capabilities.</u> What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

   The Investigators have a good track record, infrastructure and support for the work proposed.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

The budget as presented appears a little high for the calibration effort described as no new site data are to be gather from the field.

Miscellaneous comments:

None

Environmental Compliance:

Proposal Number: 232

Applicant Organization: US Fish and Wildlife Service

Proposal Title: Sacramento River Chinook Salmon Individual-based Model

1. Are the legal or regulatory issues that affect the proposal identified adequately in the proposal?

   XYes **-**No

   If no, please explain:

   No permits needed for modeling.

2. Does the project's timeline and budget reflect adequate planning to address legal and regulatory issues that affect the proposal?

   XYes **-**No

   If no, please explain:

3. Do the legal and regulatory issues that affect the proposal significantly impair the project's feasibility?

   -Yes **X**No

   If yes, please explain:

Other Comments:

Budget:

Proposal Number: 232

Applicant Organization: US Fish and Wildlife Service

Proposal Title: Sacramento River Chinook Salmon Individual-based Model

1. Does the proposal include a detailed budget for each year of requested support?

   XYes **-**No

   If no, please explain:

2. Does the proposal include a detailed budget for each task identified?

   XYes **-**No

   If no, please explain:

3. Does the proposal clearly state the type of expenses encompassed in indirect rates or overhead costs?

   -Yes **X**No

   If no, please explain:

   Component costs of OH rate are not disclosed.

4. Are appropriate project management costs clearly identified?

   -Yes **X**No

   If no, please explain:

   PM tasks not specified.

5. Do the total funds requested (Form I, Question 17A) equal the combined total annual costs in the budget summary?

   -Yes **X**No

   If no, please explain (for example, are costs to be reimbursed by cost share funds included in the budget summary).

   x

6. Does the budget justification adequately explain major expenses?

   -Yes **X**No

   If no, please explain:

   Travel costs are not detailed - # of trips, purpose, etc.

7. Are there other budget issues that warrant consideration?

   XYes **-**No

   If yes, please explain:

   Benefit costs are not specified.

Other Comments:

Verify applicant can comply with State Standard Contract language, specifically 10% retention.